Easi-Scan
Instruction Manual

BCF
Innovative Imaging

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IMPORTANT ANNOUNCEMENT
(See Care & Maintenance for More Details)

WASH DOWN OF UNIT
The main video port on the front panel needs to be sealed for the unit to be waterproof. This can either be done by attachment of the head mounted goggles display, LCD wrist display or a blanking plug (black plug shipped in carry box). These need to be secured and positively mated to avoid damage to the scanner.

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Introduction

BCF Technology Ltd is the market leader in the development and production or ultrasonic "real time" pregnancy scanners for most animal species. The company has been developing and manufacturing these systems for the last 25 years.

Using the latest state of the art technology we have combined cutting edge digital imaging with low power consumption and miniaturisation to produce Easi-Scan; a small, light, robust, portable and truly versatile ultrasound scanner.

The Easi-Scan is designed and manufactured in Scotland by:

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As specialists in providing ultrasound imaging equipment for veterinary and animal husbandry applications, we realise the importance of equipment reliability and speed of response should service assistance be required. Our engineers and their appointed agents are available to provide rapid service assistance to ensure optimum performance of BCF systems.

The Easi-Scan has been designed to conform with the protection requirements of European Directive 89/336/EEC relating Electromagnetic Compatibility (EMC) and the protection requirements of European Directive 73/23/EEC relating to electrical safety. The CE mark on the front panel is a symbol of this declaration of conformance. Contact us directly for further information regarding these directives.

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System Features

Easi-Scan is optimised for mobile real time ultrasound scanning, giving crisp imaging in target applications with minimum need for operator adjustments.

- The fixed high resolution broadband probe supports a wide application range from close up tendon study to deep penetration pregnancy work.
- Scanner settings are optimised for selected application.
- The image may be viewed on a choice of displays.
  Display options include head mounted goggles display, remote monitor using wireless video link and 5" wrist mounted LCD display.
- Images may be stored along with short audio tag, for later review. Stored images may be uploaded to computer or printed later with optional accessories.
- Three hours' continuous use from interchangeable rechargeable battery.
- The unit is water-proof in use (see comments later in manual).
- Easily cleaned; all component parts can be wiped down to clean.

Operator Safety

Easi-Scan is intended only to be powered from an isolated 12V DC source.

Using the 12V lead acid batteries supplied ensures safety from electrical hazard. If the unit must be powered from a mains adapter, use only the recommended type and use only in dry conditions.

When charging batteries, only use the charger supplied. This charger is matched to the battery capacity and will ensure long life and continued safety. Higher charge rates from unsuitable chargers may lead to hazard from fire or battery leakage in addition to reducing battery life.

Although the Easi-Scan runs from a low voltage source, dangerous high voltages are generated inside the unit. For this reason no attempt should be made to disassemble the scanner.

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1.1 PRELIMINARY SWITCH ON

Connect the display headset to the front panel connector marked DISPLAY. Rotate the connector until positive mating is made then tighten the outer ring to secure. Switch on the remote video monitor (if used), ensuring correct receive channel selected.

1.2 POWER

Use only 12 volt DC lead acid battery packs.

Ensure the charged battery pack is latched securely to the Easi-Scan. Switch on the front panel 'POWER ON' switch.

The green 'POWER' light should be illuminated and the console will now perform a system initialisation. The current scanner application will be displayed briefly followed by live scan. In addition a greybar will be visible down the left side of the display.

If viewing on the Display headset, the headset may need to be switched on separately.

The scanner will beep indicating system initialisation is complete and the system is ready to function.

1.3 SCANNING

Easi-Scan has several selectable preset scanning application modes. System GAIN may be varied to suit current study.

1.3.1 Mode selection

The scanner loads the preferred start-up mode when switched on. Pressing the 'MODE' key during live scanning steps through the preset modes in the following order;

1. Early Pregnancy/Ovary
2. Later Pregnancy
3. Tendon Mode

The preferred start-up mode may be selected by storing an image acquired using the desired mode. See 'Storing Images'.

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1.3.2 Mode description

Early pregnancy mode gives a large magnification and uses a higher ultrasound frequency to give greater resolution. Depth of study is limited to 8cm.

Later pregnancy mode provides a deeper scan (up to 11cm) using a lower frequency to enable greater penetration.

Tendon mode uses greater magnification, high frequency operation and wide dynamic range for tendon study. Further improvement to imaging may generally be gained by viewing on a monitor.

1.3.3 Gain control

Overall GAIN and NEAR GAIN may be set independently.

Initially after switching the scanner on, during live scanning the 'UP' and 'DOWN' keys control the overall gain, incrementing or decrementing the gain within the 16 possible levels.

Pressing the 'GAIN' key once toggles to near gain adjustment mode. The 'UP' key increases near GAIN. Pressing the 'GAIN' key again toggles back to OVERALL GAIN adjustment mode.

Holding the 'UP' or 'DOWN' keys pressed, will step through levels rapidly until minimum or maximum level is reached.

Preferred GAIN settings may be preserved for next use by storing an image with GAIN set at desired levels. See 'Storing Images'.

1.4 SCANNER SETUP

Preferences such as image orientation and graticule grid display may be altered and stored as default at start-up.

Image preferences may be selected in 'Setup' mode, accessed by pressing 'UP' and 'DOWN' buttons simultaneously in live scanning mode.

When setup mode is entered, no change is seen on screen, and the live scan should be visible. The buttons, however, adopt different functions as defined on the following page.

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1.4.1 Image orientation
In setup mode, the 'UP' button toggles image orientation.
The image from the probe tip may be displayed to left or right of the screen.

1.4.2 Image Scale marks
In setup mode, the 'GAIN' button toggles display of grid and depth scale.
A background 1cm square graticule, 1cm depth markers down the side of the image or no scale at all may be selected by repeated button presses.

1.4.3 Video link channel (Remote monitor option)
In setup mode, the 'MODE' button toggles through four video sender channels. Remote monitor video link channel frequency may be selected to find an unoccupied channel. The monitor channel must be adjusted to suit, using the switch accessed through the hole in the rear of the monitor casing.

Pressing the 'Freeze' button exits setup mode.

The preferred setting may be preserved for next use by storing an image with preferred settings set. See 'Storing Images'.

1.4.4 Storing images
Up to 60 images may be stored, each with a short audio tag for later identification.

1.4.5 Freeze image
Press the 'FREEZE' key during scanning to capture the desired image.
While image is frozen, the front panel keys adopt the secondary functions marked on the keys in smaller text.

1.4.6 Record audio tag
While the image is frozen, the 'RECORD' key records 4 seconds of audio, using the microphone built into the front panel.

Pressing the 'PLAY' key allows the recording to be replayed. The audio tag may be rerecorded before storing if desired.

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1.4.7 Store image

While the scan is frozen, pressing the 'STORE' key stores the current image along with the audio tag to flash memory. The non-volatile memory will retain the stored image indefinitely with the scanner switched off. The image will remain in the scanner until a further 60 images are stored, at which point it will be overwritten.

When an image is stored, the default scanner settings used at power-up are also replaced with current settings and preferences.
Settings stored are;

- Scan mode
- Gain settings
- Image orientation
- Image scale marks
- Video sender channel (Remote monitor option)

Pressing the 'FREEZE' key at any stage returns to live scan.

1.4.8 Replaying stored images

To review recorded images, the scan must first be frozen using the 'FREEZE' key. Pressing the 'REVIEW' key while in frozen state enters image replay mode.

Pressing the 'DOWN' key scrolls backwards through all recorded images, one at a time, starting with most recently recorded. The 'UP' key may be used to scroll forward again.

Switching the scanner off and back on again resets the replay position to most current recording.

Pressing the 'FREEZE' key at any stage returns to the live scan.

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Care & Maintenance

5.1 EASI-SCAN MODULE

The Easi-Scan is designed for reliability in the veterinary and animal husbandry marketplace. Our engineers and their appointed agents are available to provide rapid service assistance to ensure optimum performance of BCF systems. However, there is no substitute for careful usage.

We state that the Easi-Scan Module is WATERPROOF, but you should note the following **IMPORTANT POINTS**:

1. The unit is NOT corrosion proof and thus it should not be left wet.
2. The battery unit will fill with water – this is acceptable, but water should be drained and the unit left to dry on battery exchange or at the end of scanning session.
3. **The main video port on the front panel needs to be sealed for the unit to be waterproof. This can either be done by attachment of the head mounted goggles display, LCD wrist display or a blanking plug (available on request). These need to be secured and positively mated.**
4. The goggles are not waterproof and care should be taken to avoid submersion of this device.
5. The battery charger is not waterproof.

CLEANING

- The plastic outer case and PVC backpack (if used) can be cleaned using a cloth, soap and warm water. The front panel can be cleaned with a cleaning agent. If using soap and water on the front panel ensure that excess moisture is first removed from the cloth so no water enters the connector, speaker grille or microphone. The unit is most resistant to water when the connector for the display is firmly tightened in place.
- See Section 5.4 for probe care.
- Your equipment should be returned periodically to a BCF qualified service engineer. The service agent will use special test equipment to thoroughly check the instrument and advise of any work that appears to be necessary.

Any other service problems should be referred to our qualified service engineers. Please call 01506 460023 or email: service@bcftechnology.com.

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5.2 EASI-SCAN BATTERY

The battery unit is of sealed lead acid type and will give many hundreds of recharge cycles if supplied charger is used. While battery is in good condition and is fully charged, it will run the Easi-Scan for approximately three hours.

Electrical connection to the battery is through the latches on either side of the battery. Battery output is protected with a resetting fuse but care should be taken to prevent short circuiting between latches.

The battery unit may be cleaned by wiping down with a damp cloth.
Dry the battery unit out at the earliest opportunity if it gets wet.

Warning:
The Battery unit must not be stored damp – severe corrosion will result.

5.3 BATTERY CHARGING

The battery must first be removed from the Easi-Scan before charging.
Attach the battery to the charger by securing both latches.
Once the battery is connected the charger may be plugged in and switched on.

An indication of battery condition may be observed on the charger when the pushbutton is pressed and the unit will show state of battery condition during charging – "Low", "Good" or "Full".

The battery will require at least eight hours charging from fully discharged, but may be left connected for longer without damage.

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5.4 EASI-SCAN PROBE

While every attempt has been made to make the probe as rugged as possible the crystal array remains vulnerable and should be protected from knocks. Even a small knock against a hard object can cause damage to the probe elements situated behind the thin rubber coating on the probe face.

The probe has a protective sheath covering the length of cable subject to greatest wear and flexing. Any damage to this sheath or the rest of the cable should be repaired before further use to prevent moisture ingress that will rapidly damage the probe.

The probe should be checked regularly for such damage.

GELS
Use only gels recommended by BCF Technology Ltd.
Do not store the probe in gel.

CLEANING
The probe may be cleaned by removing all organic/protein residue and disinfecting using an IPA or 10% bleach wipe. Do not soak the transducer in IPA or bleach.

STORAGE
Clean and dry the probe head prior to storage in dry location.
Do not store the transducer in gels or cleaning/disinfecting solutions. This will lead to premature deterioration of transducer materials.

Warning:
Never sterilize the transducer with autoclave, ultraviolet, gamma radiation, gas, steam or heat sterilization techniques. Severe damage will result.

Do not expose the transducer to materials containing the following agents:
- Acetone
- Methanol
- Mineral oil
- Iodine
- Freon
- Industrial cleaners
- Materials containing perfumes (lotions, gels, etc.)
- Transducers must not be soaked in alcohol, bleach, hydrogen peroxide

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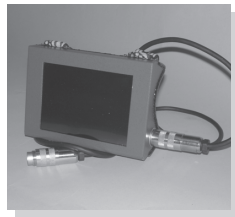
Accessories

Mains Supply CRT Monitor
& Carry Bag

Head-up Goggles Display



Wrist-mount LCD Display

Battery CRT Monitor
& Carry Bag

12V Car Charger

Replacement Probe

Video Capture Software
& cables

Video Lead for Video
Graphic Printers

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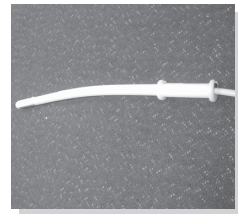
Accessories

Backpack



Probe Introducer

Spare Battery

MyVu Goggles

Carry Box

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Technical Specification

Digital Ultrasound scanner with display headset, fixed probe & rechargeable battery

Size (battery attached)	28.0cm x 19.5cm x 9.5cm
Weight (battery attached)	3.0kg
Mechanical	Splashproof, rugged plastic casing
User Operation	Wipe down 5 button key panel with weatherproof microphone and playback speaker
User Functions	Selection of operating modes optimised to application, automatically setting suitable range, frequency & post processing e.g. dynamic range, edge enhancement, Early pregnancy / ovary Later pregnancy Tendon Gain settings Overall Gain adjustable Gain depth balance adjustable (near gain) Image freeze Image store: record soundbyte tag for image identification during image review Replay/ re-record sound tag option Image review step through stored images, replaying soundbyte tag,
Display	Splashproof display headset provides between bright 320 x 240 & 640 x 480 (user option) resolution, equivalent to viewing 48" screen 2m distant while allowing good vision of surroundings Composite video format 256 Greyshades
Storage	60 images with 4 second soundbyte tag each Oldest image is overwritten when a new image is stored Stored on non-volatile internal flash memory
Probe	Broadband straight linear rectal Active array length 65mm Frequency range 4.5 to 8.5 MHz 128 element crystal array
Power	12V 3.2Ah Battery pack clips onto scanner giving three hours continuous use. Optional operation from mains adapter

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